DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018-AB73

Endangered and Threatened Wildlife and Plants; Proposed Rule to List the Peninsular Ranges Population of the Desert Bighorn Sheep as Endangered

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: The Fish and Wildlife Service (Service) proposes to list the Peninsular Ranges population of desert bighorn sheep (*Ovis canadensis*) as an endangered species pursuant to the provisions of the the Endangered Species Act of 1973, as amended (Act). A disease epizootic has contributed to significant declines in certain mountain ranges that are already stressed as a result of habitat loss and degradation, competition from feral and domestic livestock, lack of water, and other factors. The range of this population of desert bighorn sheep extends along the Peninsular Ranges from the vicinity of Palm Springs, California, into Baja California, Mexico. The total of individuals in the United States numbers fewer than 400, distributed among 7 mountain ranges, which is a population decrease from 1,171 reported in 1979. Lamb recruitment rates are at a critically low number throughout most of the range of the population and are inadequate to maintain current population size. Status surveys in Mexico were initiated in 1988; preliminary estimates indicate that a noticeable decline has occurred. This proposed rule, if made final, would extend the Act's protection to the Peninsular Ranges population of bighorn sheep. The Service seeks data and

comments from the public on this proposed rule.

DATES: Comments from all interested parties must be received by November 4, 1992. Public hearing requests must be received by June 22, 1992.

ADDRESSES: The complete file for this rule is available for inspection during normal business hours at the U.S. Fish and Wildlife Service, Carlsbad Field Office, 2730 Loker Avenue West, Carlsbad, California 92008 (telephone 619/431-9440). Comments and materials received will be available for public inspection, by appointment, during normal business hours at the above address.

FOR FURTHER INFORMATION CONTACT: Jeffrey D. Opdycke, Field Supervisor (see **ADDRESSES** section).

SUPPLEMENTARY INFORMATION:

Background

All desert bighorn sheep belong to the species *Ovis canadensis* (family Bovidae), described by Shaw in 1804. Researchers later attempted to separate the species into several subspecies or races based primarily on geographic location and differences in skull measurements (Buechner 1960, Cowan 1940, Hall 1981). These subspecies or races of bighorn sheep include *Ovis canadensis cremnobates* (Peninsular bighorn), *O. c. nelsoni* (Nelson bighorn), *O. c. mexicana* (Mexican bighorn), *O. c. weemsi* (Weems bighorn), *O. c. california* (California bighorn), and *O. c. canadensis* (Rocky Mountain bighorn). Authorities differ on the precise geographic limits of *O. c. cremnobates* and *O. c. nelsoni*. The range of the population that is the subject of this proposed rule is the same as that of *O. c. cremnobates*, as recognized by the California Department of Fish and Game. For convenience and consistence with State listing, the population will be referred to as the Peninsular bighorn in the narrative of this proposal.

The Peninsular Ranges support a distinct and isolated population of bighorn. The Peninsular bighorn ranges from the San Jacinto Mountains, California, southward through the Santa Rosa Mountains and the Borrego area and continuing into Baja California, Mexico. The area is bounded to the north by Interstate 10 and to the East by the Salton Sea. As described above, the Service's definition of the Peninsular Ranges population of desert bighorn sheep coincides with the distribution of the subspecies *O. c. cremnobates* accepted by the California Department of Fish and Game.

The Peninsular bighorn is similar in appearance to other desert bighorn sheep. Pelage is pale brown and permanent horns, becoming rough and scarred with age, vary from yellowish-brown to dark brown. Horns of the male are massive and coiled; in females they are smaller and not coiled. In comparison to other desert bighorn, the Peninsular bighorn is generally described as having paler coloration and larger and heavier horns that are moderately divergent at the base (Richard Weaver, California Department of Fish and Game (retired), pers. comm, 1992).

The population occurs along desert slopes of the Peninsular Ranges from the vicinity of Palm Springs south into northern Baja California, Mexico. Typical terrains occupied by the Peninsular bighorn is hot and dry desert regions where land is rough, rocky, sparsely vegetated and characterized by steep slopes, canyons, and washes. Most of these sheep live between 300 and 4,000 feet (91 and 1,219 meters) in elevation where average annual precipitation is less than 4 inches (10 centimeters) and daily high temperatures average 104° in the summer (Bighorn Institute 1990a). Caves and tree shelters are used during inclement weather and to escape disturbance. Lambing areas are associated with ridge benches or canyon rims adjacent to steep slopes or escarpments.

In the early 19th century, bighorn sheep in North America numbered between 1,500,000 and 2,000,000, but today total approximately 40,000 (Bighorn Institute 1990b, Buechner 1960). In California, bighorns have been extirpated from 16 mountain ranges in the past 40 years, leaving approximately 4,500 to 4,750 bighorn in California at present (Bighorn Institute 1990b; Vernon Bleich, Wildlife Biologist, California Department of Fish and Game, presentation to Desert Bighorn Council, April 3, 1991).

Weaver (1989) recalls that the Peninsular bighorn was once described as having the most dense and stable population of all bighorn sheep in California. However, the Peninsular bighorn has declined to fewer than 400 individuals, reduced from estimates of 1,171 in 1979. The population currently occurs in seven mountain ranges in California, located in Riverside and eastern San Diego Counties. It is presumed extirpated from the Fish Creek Mountains (western Imperial County) and Sawtooth Range (San Diego County). Estimated numbers of bighorns in specific mountains are as follows: San Jacinto Mountains (15), Santa Rosa Mountains (northern and southern portions) (120), Pinto/Inkopah Mountains (10), Corrizo Gorge (25), Vallecito Mountains (20), Coyote Canyon (100), and Borrego Canyon/Tubb Canyon/Pinyon Ridge (90) (Anza-Borrego Desert State Park, unpublished data 1990; Bighorn Institute, unpublished data). The California Department of Fish and Game's 1979 estimates were San Jacinto Mountains (280), Santa Rosa Mountains (northern and southern portions) (500), Pinto/Inkopah Mountains (20), Corrizo Gorge (83), Vallecito Mountains (19), and Coyote Canyon/Borrego Canyon/Tubb Canyon/Pinyon Ridge (165).

Approximately 20 individuals are in captivity at the Bighorn Research Institute in Palm Desert, California. The Bighorn Institute, a private, nonprofit organization, was established in 1982 to initiate a research program for the Peninsular bighorn. The Living Desert, an educational and zoo facility also located in Palm Desert, California, maintains a group of 10 to 12 Peninsular bighorn sheep at its facility.

No comprehensive population estimates are available for Baja California, Mexico. Although Alvarez (1976) estimated between 4,500 and 7,850 Peninsular bighorns in Baja California, preliminary surveys conducted by the Bighorn Institute in 1990 suggest that these numbers are over-estimated and that there are probably between 1,500 and 2,500 Peninsular bighorns in Mexico (James DeForge, Director, Bighorn Institute, pers. comm., 1991). Researchers have recognized that bighorn sheep numbers have been declining in Mexico, even to critical numbers in some places (Alvarez 1976). By Presidential decree, the hunting season in Baja California was closed in 1991.

Depressed recruitment, coupled with habitat loss and degradation and other factors, have contributed to the decline of the population. Specific recruitment data are unavailable for the majority of mountain ranges; however, available data indicate that recruitment rates are below those necessary to maintain the current population level. Approximately 90 percent of lambs die between 2 and 4 months of age in the Santa Rosa Mountains owing to bacterial pneumonia (Weaver 1989). A survey conducted in 1990 by the Bighorn Institute indicated that no lambs born in the spring of 1990 in the northern portion of the Santa Rosa Mountains survived. These sheep have declined from 150 individuals in 1972 to 41 adult animals in 1990. More than half of these remaining animals were released from the Bighorn Institute and included captive and

rehabilitated animals (Bighorn Institute 1990b).

The southern Santa Rosa Mountains area has also had significant lamb mortality, with only one lamb counted in a 1982 survey by the California Department of Fish and Game (DeForge and Scott 1982). High lamb mortality has been documented from the San Jacinto Mountains (DeForge and Scott 1982) and the Jacumba and Inkopah Mountain ranges since the 1970s (Jorgensen, undated). Preliminary surveys in northern Baja California suggest that bighorn sheep in Mexico are also experiencing high lamb mortality (DeForge, pers. comm., 1991).

Several development projects, long term drought, and grazing by domestic livestock also threaten the population. Much of the land occupied by the Peninsular bighorn is in public ownership on lands administered by the Bureau of Land Management (Bureau), the U.S. Forest Service, or the State of California. Grazing allotments granted by these two Federal agencies may affect bighorns.

Previous Federal Action

The September 18, 1985, **Federal Register** (50 FR 37958) Animal Notice of Review included *Ovis canadensis cremnobates* as a category 2 candidate for listing. Category 2 species are those species for which information in the Service's possession indicate that proposing to list as endangered or threatened is possibly appropriate, but for which conclusive data on biological vulnerability and threat are not currently available to support proposed rules. The January 6, ,1989, **Federal Register** (54 FR 554) Notice of Review also included the subspecies as a category 2 candidate species. In 1990, the Service inititated an internal status review of the subspecies.

On July 15, 1991, the Service received a petition from the San Gorgonio chapter of the Sierra Club to list the Peninsular bighorn sheep as an endangered species. This petition requested that the Service list either through emergency or normal procedures, the Peninsular bighorn throughout its entire range, or at least the sheep in the Santa Rosa and San Jacinto Mountains. Another petition to list the United States segment of this population was received on October 31, 1991, from Natureguard of Redondo Beach, California. At the time the July 15, 1991, petition was received, the Service had already completed an internal status review of the species. In accordance with section 4(b)(3)(A) of the Act, on December 30, 1991, the Service found that substantial information had been presented in the July 15, 1991, petition and otherwise available to the Service indicating that the petitioned action may be warranted. The October 31, 1991, petition was regarded as a second petition and a separate finding was not made. The Service's review of the species' status found that sufficient information on biological vulnerability and threats is available to support a proposal to list the Peninsular Ranges population of bighorn sheep as endangered. Although the findings of the Service's status review changed the candidate status of this species from a category 2 to a category 1, this change was inadvertently omitted from the November 21, 1991, Animal Notice of Review (56 FR 58804). This proposed rule reflects the Service's finding at the conclusion of the status review and constitutes the 1-year finding for the petitioned action that proposing to list the Peninsular bighorn sheep is warranted.

Summary of Factors Affecting the Species

Section 4 of the Endangered Species Act (16 U.S.C. 1533) and regulations (50 CFR part 424) promulgated to implement the listing provisions of the Act set forth the procedures for adding species to the Federal Lists. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1). The Act defines species to include subspecies and any distinct population segment of any vertebrate fish or wildlife that interbreeds when mature. The factors and their application to the Peninsular Ranges population of bighorn sheep (*Ovis canadensis*) are as follows:

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

Peninsular bighorn sheep are located on Peninsular Ranges located in San Diego and Riverside Counties, California, and extending into Baja California, Mexico. They are presumed extirpated from Fish Creek Mountains (Imperial County) and Sawtooth Range (San Diego County). In the United States, the number of individuals has declined from an estimated 1,171 in 1979 to less than 400 in 1990. Preliminary status surveys in Mexico estimate between 1,500 and 2,500 Peninsular sheep. Habitat loss and degradation in the range of the population threaten its continued existence. The proliferation of residential communities, development of transportation corridors, water development projects, vehicular and pedestrian recreational uses, and historic mining operations have contributed to the decline of suitable habitat. In the United States, much of the land occupied by the Peninsular bighorn sheep is in a checkerboard pattern of public/private ownership. However, the Bureau and Forest Service continue to coordinate land exchanges with landowners to acquire lands beneficial to Peninsular bighorn sheep. Leasing of grazing allotments held by these agencies may affect bighorns, since livestock compete with bighorns for food and water in addition to having a potential for carrying disease (see Factor C.)

Several development projects are proposed within the privately-owned portions of land within the range of the Peninsular bighorn sheep. Two projects are proposed to be located adjacent to the Bighorn Institute and may have an adverse effect on the success of certain Institute operations. Further development could adversely affect the bighorn by reducing available habitat, introducing a variety of disturbance factors, and fragmenting natural corridors within the range of the population. In addition, habitat degradation probably contributes additional stress to the sheep, making them more susceptible to disease and reproductive failure.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Sport hunting of desert bighorn sheep has occurred throughout history. Currently desert bighorn sheep populations are relatively low in relation to the demand for desert bighorn hunting opportunities in North America, and few areas are open to hunting. Many states utilize a lottery or auction system for allocating permits. In terms of trophy hunting, it is one of the most highly sought big game species in North America. Sheep have been protected in California since 1873; however, limited sport hunting of *Ovis canadensis nelsoni* has occurred since 1967. No legal hunting of the Peninsular bighorn sheep occurs. Poaching is known to occur; however, the extent of poaching is not known. In Mexico, regulated hunting of the Peninsular bighorn sheep occurred in recent years. The government of Mexico has shown recent concern that the number of sheep is declining and by Presidential decree closed the hunting season beginning in 1991. Approximately seven hunting permits per year may still be issued. Anecdotal information suggests that poaching is significant in Mexico.

C. Disease or Predation

Bighorn sheep are susceptible to a variety of bacterial, fungal, and viral infections (Clark *et al.* 1985, Turner and Payson 1983, DeForge *et al.* 1982) and may be experiencing an immune system deficiency. Lambs and older sheep may be more susceptible to diseases. Numerous endoparasites and ectoparasites have been documented (Lopez-Fonseca 1979, Russi and Monroe 1976).

The relationship between disease and factors such as stress, density, competition, water availability, and disturbance are not well investigated (Allen 1980, Russi and Monroe 1976). Disease manifestation probably occurs during stressful periods such as high or low population levels, reproductive activity, low nutrient availability, and climatic stress (Taylor 1976, Turner and Payson 1982). Wehausen *et al.* (1987) investigated recruitment data from 1962 to 1982 in the Santa Rosa Mountains. During 1962 to 1976, lamb:ewe ratios averaged 39.5:100 as compared to 15.7:100 from 1977 to 1982. He found a recruitment rate of 16–18 lambs:100 ewes necessary for population maintenance. Similarly McQuivey (1978) reported 26 lambs:100 ewes necessary for population stability, although Wehausen *et al.* (1987) suggests that the McQuivey's ratio should actually be 20 lambs:100 ewes. Lamb survival appears to be the driving variable for recruitment rates (Wehausen *et al.* 1987). The most recent information available to the Service reveals that the majority of ranges in the Peninsular Mountains are not experiencing sheep recruitment rates sufficient to maintain themselves. For example, the northern Santa Rosa Mountains had no lamb survival in 1990. These areas consist primarily of older animals, and death owing to old age represents a significant portion of the total deaths, resulting in a declining status.

Depressed recruitment throughout most of the Peninsular bighorn range, owing to significant mortality of lambs, is probably linked to a disease epizootic. In the northern Santa Rosa Mountains, excessive mortality of lambs has occurred since 1977 and is estimated at 90 percent for lambs between 2 and 4 months of age (Weaver 1989). DeForge *et al.* (1982) provided evidence that lamb mortality in the Santa Rosa Mountains was due to pneumonia. Bacterial pneumonia is usually secondary to damage caused by another agent such as a virus, parasite, or environmental stress that lowers an animal's resistance to disease. DeForge and Scott (1982) reported serological evidence that a combination of parainfluenza-3 (PI–3), bluetongue (BT), epizootic hemorrhagic disease (EHD), and contagious echthyma (CE) viruses may be the initiating factors to pneumonia in the Santa Rosa Mountains. In addition to exposure to the above mentioned diseases, Jessup (Veterinary Medical Officer, California Department of Fish and Game, *in litt.*, 1991) reports that antibody titers to bovine respiratory syncytial virus (BRSV) have been found in at least one range, and several pathogenic bacteria have been isolated from sick lambs. In addition to disease, nutrition, competition, predation, climatic changes, and human impacts may also be contributing factors to high mortality. Vaccination experiments have been conducted for BT and PI–3. Vaccines for PI–3 have been used with limited success in captive and wild sheep.

Domestic and feral cattle can act as disease reservoirs for bighorn sheep. Several viruses discovered in sick bighorn lambs were non-native and thought to be introduced by domestic livestock (Jorgensen 1987). The potential role of livestock in disease transmission is not well understood. The Anza-Borrego Desert State Park, which borders Riverside County to the north and extends south to just north of Baja California, Mexico, completed a project to remove 119 feral cattle from the Park in 1990. Six viruses were detected in these cattle. Blood samples taken from cattle grazing in allotments adjacent to the Peninsular bighorn sheep habitat within the Anza-Borrego Desert State Park have contained several virsuses. Despite the removal of cattle from the Park, the sheep numbers continue to decline. Peninsular bighorn sheep in Mexico also show exposure to common viral and bacterial diseases (DeForge, pers. comm., 1991); however, more work is needed to determine the extent of disease. Other livestock may transmit diseases as well. Domestic sheep harbor *Pasteurella* sp. bacteria that can skill bighorn, and close contact results in transmission to and the subsequent death of most or all of the exposed bighorns (State of California 1988). In 1988, all animals (approximately 65) from a relocated group of *Ovis canadensis californiana* died as a result of pneumonia believed to have been contracted from one domestic sheep (Weaver 1989). In 1981, the herd of *O. c. california* at Lava Beds National Monument (approximately 42 animals) died of pneumonia over a 1-month period following contact with domestic sheep (State of California 1988).

Predation from natural predators, such as coyotes, bobcats, mountain lions, foxes, eagles, and free-roaming dogs has been documented. Although predation is assumed to be insignificant to most populations, it could become significant to small populations weakened by disease and malnutrition. In recent years, mountain lion kills have increased in the northern Santa Rosa Mountains (DeForge, pers. comm., 1991). Owing to the nature of bighorn habitat, most predation is opportunistic, and predators do not rely heavily on Peninsular bighorns for survival. Sheep encounters with domestic and wild dogs are likely to increase with an increase in development.

D. The Inadequacy of Existing Regulatory Mechanisms

The California Department of Fish and Game has listed *Ovis canadensis cremnobates* as rare or threatened since 1972. Pursuant to the California Fish and Game Code and the California Endangered Species Act, it is unlawful to import or export, take, possess, purchase, or sell any species or part or product of any species listed as endangered or threatened. Permits may be authorized for certain scientific, educational, or management purposes. The California Act requires that State agencies consult with the Department of Fish and Game to ensure that actions are not likely to jeopardize the continued existence of any listed species. State protection does not include habitat safeguards available under section 7 of the Federal Act. The lack of State projects within the bighorn habitat has led to few, if any, consultations under the California Act (Vernon Bleich, Wildlife Biologist, California Department of Fish and Game, pers. comm., 1991).

The Fish and Game Code also provides for management and maintenance of bighorn sheep. The policy of the State is to encourage the preservation, restoration, utilization, and management of California's bighorn sheep.

The California Department of Fish and Game supports the concept of separating livestock from bighorns to create buffers to decrease disease transmission potentials, through purchase and elimination of livestock allotments. However, it has not been a policy of the Department to recommend removal of current livestock permittees (State of California 1988). Protection provided by the State Act has failed to reverse the population decline of the Peninsular bighorn.

Protection for the Peninsular bighorn in Mexico is limited, and it has been a recently hunted species. Presidential decree closed the hunting season in 1991. The Mexican population of *Ovis canadensis* was listed as an appendix II species on July 1, 1975, under the Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES). This convention, as implemented by the Act and various regulations (50 CFR part 23), imposes restrictions on the importation and exportation of appendix II species.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

Owing to the small population size and limited distribution of Peninsular bighorn sheep, factors such as drought, disturbance, inbreeding, pesticides, and other contributing sources of mortality may affect the population.

Drought, disturbance at watering sites, water withdrawal, and competition from domestic and introduced species limits the amount of water available to and utilized by the sheep. Bighorn sheep exhibit a seasonal pattern of distribution, primarily affected by forage and water availability. Water is available via tinajas, springs, and guzzlers. During late summer and early winter (July-November), when water requirements and breeding activities are at a peak, sheep tend to concentrate near watering places, particularly as tinajas and springs dry up. During this time, sheep depend on a reliable water source and vegetative diversity. Bighorns require a quantity of water approximately equal to four percent of their body weight (one gallon) per day during summer months and a dependable water supply is needed every 2 miles (Bleich 1987, Blong and Pollard 1968). When water is not available in sufficient quantities, older sheep and lambs die, as they require more water and food in hot, dry weather. Wehausen *et al.* (1987) found a strong correlation between fall and winter precipitation and lamb recruitment the following summer or fall. The consecutive 5-year drought in California has undoubtedly affected the State's bighorn sheep. In addition, a decrease in available water and subsequent concentration of sheep around watering sites can lead to overgrazing, increased density and subsequent stress, and disease transmission.

Interspecific competition for food and water has contributed to the decline of desert bighorn sheep. Mule deer, collared peccary, black-tailed jack rabbit, domestic sheep, cattle, burros, and goats may compete with bighorn (Monson and Sumner 1980). Mule deer (*Odocoileus hemionus*) and bighorn sheep overlap in range during winter months. However, since the bighorn sheep prefers rougher terrain, their use of specific habitat rarely overlaps. Where their ranges do overlap, food preferences tend to be different, with the bighorn sheep preferring grasses and the deer preferring browse. Where ranges overlap and conditions allow for large deer herds to persist, deer can destroy vegetation by trampling. No information suggests that competition from deer has significantly limited the bighorn. Although healthy bighorn populations can coexist with native competitors, they can be expected to be more susceptible to such competition as their populations decline and they are stressed by other factors.

Burros also prefer a flatter terrain than bighorn sheep. The range of food consumed by burros is generally broader; however, during the dry season competition near watering sites may significantly limit the available food supply for bighorn sheep. Burros tend to be destructive, pulling vegetation out by the roots. In addition, burros tend to drink more water and spend more time at watering sites. Because bighorn will often wait until the burros have left, the amount of water consumed by the bighorn sheep may be decreased. Burros may also foul a water source, further diminishing its use by bighorns.

Domestic livestock (cattle and sheep), in addition to transmitting diseases, compete with bighorn sheep for water and food, particularly grasses. Permitted grazing occurs on public lands administered by the Bureau and the Forest Service within the range of the Peninsular bighorn.

Bighorn sheep are sensitive to disturbance and will withdraw form an area if disturbance is great enough. The presence of a disturbing factor may interfere with the sheep's water use, even if it is abundant and permanent, which can affect survival, particularly of lambs and older animals. Ewes will seldom give birth in an area disturbed by outsiders. Disturbance factors may include low flying aircraft, vehicular traffic, and human activities. The degree of disturbance depends on topography and the extent, type, and duration of disturbance (Hamilton *et al.* 1982, Miller and Smith 1985). DeForge *et al.* (1981) suggested the human activity (e.g., road construction, early mining activities, introduction of feral animals, and grazing of livestock) may have been a contributing factor in the loss of the China Lake (California) Naval Weapons Center desert bighorn sheep (*Ovis canadensis nelsoni*). Permanent human occupancy will likely cause bighorns to move away from an area. Bighorn sheep are generally reluctant to move across open country away from normal habitats.

The loss of dispersal corridors and fragmentation and bisection of the bighorn's habitat, coupled with increased habitat loss, disturbance, and decreased availability of water, have isolated certain portions of the population. Few individuals, along with the lack of genetic exchange with sheep from other regions, will lead to inbreeding. Inbreeding and the resultant loss of genetic variability can result in reduced adaptiveness, viability, and fecundity, and may result in local extirpations. Although inbreeding has not been directly demonstrated in the Peninsular bighorn sheep, the number of sheep occupying many areas is critically low. The minimum size at which an isolated group can be expected to maintain itself without the deleterious effects of inbreeding is not known. Recruitment clearly is not adequate to stabilize the extant population (Krausman and Leopold 1986). Researchers suggest that a minimum effective population size of 50 is necessary to avoid short-term inbreeding depression, and 500 to maintain genetic variability for long-term adaptation (Franklin 1980). The Bureau of Land Management (1986) considers 100+/−20 desert bighorn sheep, with normal age and sex structures, to be a viable population. Even with this conservative criterion, these numbers suggest that Peninsular bighorn sheep in many areas are not able to maintain genetic diversity, population viability, or preserve fitness. Berger (1990) studied bighorn populations in the southwestern United States and found that all populations with less than 50 individuals became extinct within 50 years. Berger concluded that extinction in populations of this size cannot be overcome without intensive management, because 50 individuals, even in the short-term, do not constitute a minimum viable population size. Four of the seven U.S. mountain ranges supporting Peninsular bighorn sheep have fewer than 50 animals.

Turner (1978, 1979) reported high levels of organochlorines and PCB residues in bighorn lambs, suggesting chronic exposure to pesticides commencing with the lamb's first suckling or before. However, none of the levels were significant enough to cause acute debilities, presumably because of

the sheep's low level within the trophic structure as herbivores.

Other causes of mortality such as old age, falls, fights between males, and road kills could affect the continued survival of groups that are critically small and experiencing severe reductions in recruitment.

Any one of the factors discussed above or other natural or unnatural consequences could, at any time, result in losses that would be irreversible and reduce the population to a point at which natural recovery is no longer considered achievable.

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by this population in determining to propose this rule. Based on this evaluation, the preferred action is to list the Peninsular bighorn as an endangered species. Disease, causing excessive lamb mortality, is affecting the majority of the sheep within the population, resulting in groups too small to be considered viable and recruitment rates insufficient to maintian current status. Although the Peninsular bighorn population has been declining since at least 1972, the rate of decline has increased in recent years. Additional losses in certain mountian ranges could be irreverisible and reduce the population to a point at which recovery is no longer feasible without massive management intervention. Federal listing of the Peninsular bighorn would provide habitat protection through the section 7 consultation process and would result in Federal participation in recovery activities, including the development of a coordinated recovery plan and the allocation of funds.

As previously mentioned, the Mexican population of the Peninsular population has been protected from hunting since 1991. Apparently this action was based on information the Mexican government received that demonstrated a recent decline in the number of sheep found in Baja (Mexico). The Service will make a direct request to the Government of Mexico for any information that is available on its population of Peninsular bighorns. As the proposed rule is based on the best available information to the Service, any new information which demonstrates that the Mexican population has stable or increasing numbers may prove this proposal to be unwarranted. If so, the Service will withdraw this proposal.

Status of Peninsular Bighorn Sheep Currently Held in Captivity

Under section 9(b)(1) of the Act, certain prohibitions applicable to listed species would not apply to Peninsular bighorn sheep held in captivity or in a controlled environment on the date of publication of any final rule, provided that such holding and subsequent holding or use of sheep was not in the course of a commercial activity.

Critical Habitat

Section 4(a)(3) of the Endangered Species Act, as amended, requires that, to the maximum extent prudent and determinable, the Secretary designate critical habitat concurrently with determining a species to be endagered or threatened. The Service finds that the designation of critical habitat is not prudent for this species. Such a determination would result in no known benefit to the sheep. All involved parties and major landowners are aware of the general location and importance of protecting the Peninsular bighorn sheep and its habitat. The identification of precise locations of bighorn sheep habitat that would result from the publication of detailed critical habitat maps and descriptions in the **Federal Register** would very likely lead to increased poaching of this highly prized game animal. As discussed under Factor B, some poaching is already occurring. Protection of habitat will be addressed through the recovery process and through the section 7 consultation process. The Service therefore finds that designation of critical habitat for the Peninsular bighorn sheep is not prudent at this time, because such a designation would increase the degree of threat from poaching or other human activities, and because it is unlikely to aid in the conservation of this species.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Endangered Species Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain activities. Recognition through listing encourages and results in conservation actions by Federal, State, and private agencies, groups and individuals. The Endangered Species Act provides for possible land acquisition and cooperation with the States and requires that recovery actions be carried out for all listed species. The protection required of Federal agencies and the prohibitions against taking and harm are discussed, in part, below:

Section 7(a) of the Endangered Species Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is being designated. Regulations implementing this interagency cooperation provision of the Endangered Species Act are codified at 50 CFR part 402. Section 7(a)(4) of the Act requires Federal agencies to confer informally with the Service on any action that is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat. If a species is listed subsequently, section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of such a species or to destroy or adversely modify its critical habitat. If a proposed Federal agency action may affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service.

A development proposed in the Santa Rosa Mountains adjacent to the Bighorn Institute may require a permit from the U.S. Army Corps of Engineers pursuant to the Clean Water Act to conduct project-related activities within or adjacent to a desert wash on the project site. If a permit is required, the Corps of Engineers would be subject to the section 7 consultation requirements of the Act if the species becomes listed.

Several Federal land managers are responsible for administering lands occupied by the Peninsular bighorn. The Bureau of Land Management has a rangewide plan for management of habitat of the bighorn sheep on public lands. This is a comprehensive plan for inventory, management, monitoring, and research. The Bureau of Land Management maintains land in the Santa Rosa Mountains and the Jacumba/Inkopah Mountain ranges. Much of the bighorn habitat is contained in a checkerboard pattern of public and private land ownership. In addition to the Bureau, the Forest Service has been consolidating much of these lands into public ownership. Grazing allotments have resulted in some cattle entering Federal lands and competing for resources with the bighorns. In addition to competing for food and water, domestic cattle on or adjacent to areas used by bighorns may introduce or transmit disease. Other Federal land managers within the range of the Peninsular bighorn include the Bureau of Indian Affairs, the Bureau of Reclamation, and the Department of Defense. These agencies would be required to consult with the Service if any activities they authorize, fund, or

carry out may affect the Peninsular bighorn sheep.

The Act and implementing regulations found at 50 CFR 17.21 set forth a series of general prohibitions and exceptions that apply to all endangered wildlife. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to take (including harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt any such conduct), import or export, transport in interstate or foreign commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce any listed species. It is also illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions apply to agents of the Service and State conservation agencies.

Permits may be issued to carry out otherwise prohibited activities involving endangered wildlife species under certain circumstances. Regulations governing permits are at 50 CFR 17.22 and 17.23. Such permits are available for scientific purposes, to enhance the propagation or survival of the species, to alleviate economic hardship in certain circumstances, and/or for incidental take in connection with otherwise lawful activities.

Increased recognition and an active recovery program would provide a means to ensure survival for the Peninsular bighorn sheep. Available funding would be used on research to determine causes, treatment, and prevention of lamb mortality, and range maintenance projects to benefit the sheep.

The Mexican population of *Ovis canadensis* was listed as an Appendix II species on July 1, 1975, under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). This convention, as implemented by the Act and various regulations (50 CFR part 23), imposes restrictions on the importation and exportation of appendix II species.

Public Comments Solicited

The Service intends that any final action resulting from this proposal will be as accurate and as effective as possible. Therefore, comments or suggestions from the public, other concerned governmental agencies, the scientific community, industry, or any other interested party concerning this proposed rule are hereby solicited. Comments particularly are sought concerning:

(1) Biological, commercial trade, or other relevant data concerning any threat (or lack thereof) to the Peninsular Ranges population of desert bighorn sheep;

(2) The location of any additional ranges of this population and the reasons why any habitat should or should not be determined to be critical habitat as provided by section 4 of the Act;

(3) Additional information concerning the range, distribution, and size of this population; and

(4) Current or planned activitites in the subject area and their possible impacts on this population.

Any final decision on this proposal will take into consideration the comments and any additional information received by the Service, and such communications may lead to a final regulation that differs from this proposal.

The Endangered Species Act provides for a public hearing on this proposal, if requested. Requests must be received within 45 days of the date of publication of the proposal. Such requests must be made in writing and addressed to the Fish and Wildlife Service (see **ADDRESSES** section).

National Environmental Policy Act

The Fish and Wildlife Service has determined that an Environmental Assessment, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended. A notice outlining the Service's reasons for this determination was published in the **Federal Register** on October 25, 1983 (48 FR 49244).

References Cited

A complete list of references cited in this rule is available upon request from the Fish and Wildlife Service (see **ADDRESSES** section).

Author

The primary author of this rule is Lynn Wilson Oldt, Fish and Wildlife Biologist, 2140 Eastman Avenue, suite 100, Ventura, California 93003.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, and Transportation.

Proposed Regulation Promulgation

PART 17—[AMENDED]

Accordingly, it is hereby proposed to amend part 17, subchapter B of the chapter I, title 50 of the Code of Federal Regulations, as set forth below:

1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 16 U.S.C. 1531–1544; 16 U.S.C. 4201–4245; Public Law 99–625, 100 Stat 3500; unless otherwise noted.

2. It is proposed to amend § 17.11(h) by adding the following, in alphabetical order under "Mammals", to the List of Endangered and Threatened Wildlife:

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
Mammals							
*	*	*	*	*	*	*	*
Sheep, bighorn	*Ovis canadensis*	U.S.A. (Western conterminous states), Canada (southwestern), Mexico (northern).	U.S.A.: Peninsular Ranges of CA; Mexico (BC).	E		NA	NA
*	*	*	*	*	*	*	*

Dated: April 21, 1992.

Richard N. Smith,

Acting Director, Fish and Wildlife Servi

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